

Missouri Department of Natural Resources

Total Maximum Daily Load Information Sheet

Little Beaver Creek

Waterbody Segment at a Glance:

County: Phelps
Nearby Cities: Rolla
Length of impairment: 0.1 miles
Pollutant: Volatile Suspended Solids (VSS)
Source: Rolla SW Wastewater Treatment Plant



State map showing location of watershed

Note: Water quality studies since the development of the 2002 303(d) List suggest there is no longer a VSS problem in this stream but data indicate there are low dissolved oxygen levels for at least two miles below the Rolla SW WWTP.

TMDL Priority Ranking: The permit was accepted in lieu of a TMDL in 2006

Description of the Problem

Beneficial uses of Little Beaver

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life
- Protection of Human Health associated with Fish Consumption
- Whole Body Contact Recreation

Use that is impaired

- Protection of Warm Water Aquatic Life
- Whole Body Contact Recreation

Standards that apply

- The standards for volatile suspended solids (VSS) may be found in the general criteria section of the WQS at 10 CSR 20-7.031(3)(A) and (C).
 - Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses.
 - Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses.

Background Information and Water Quality Data

Any water body that was listed for Non-filterable Residue (NFR) in 1998, like Little Beaver Creek, is now being listed for Volatile Suspended Solids (VSS). This change was made to better distinguish between solids coming from wastewater treatment plants (VSS) and solids coming from soil erosion or erosion of mine waste materials or stockpiles (Non-Volatile Suspended Solids or NVSS). VSS includes particles that are suspended in water, like algae, or those that settle out, like the sewage sludge in Little Beaver Creek. When these solids settle onto the streambed, they smother natural substrates (stream bottom), aquatic invertebrate animals and fish eggs. Visual surveys Little Beaver Creek prior to 2003 indicated some deposition of organic solids downstream of the Rolla Southwest Wastewater Treatment Plant (SW WWTP) and an adjoining sand and gravel washing operation.

In 2003, a water quality study of Little Beaver Creek by the department found little deposition of fine sediments at locations 0.4 and 0.6 miles downstream of the Rolla SW WWTP. This study did show lower levels of dissolved oxygen (DO) downstream of the facility. Wastewater effluent that is high in BOD will lower the DO in a stream and many aquatic organisms require high levels of oxygen to survive. Water quality data from this study is summarized in the table below.

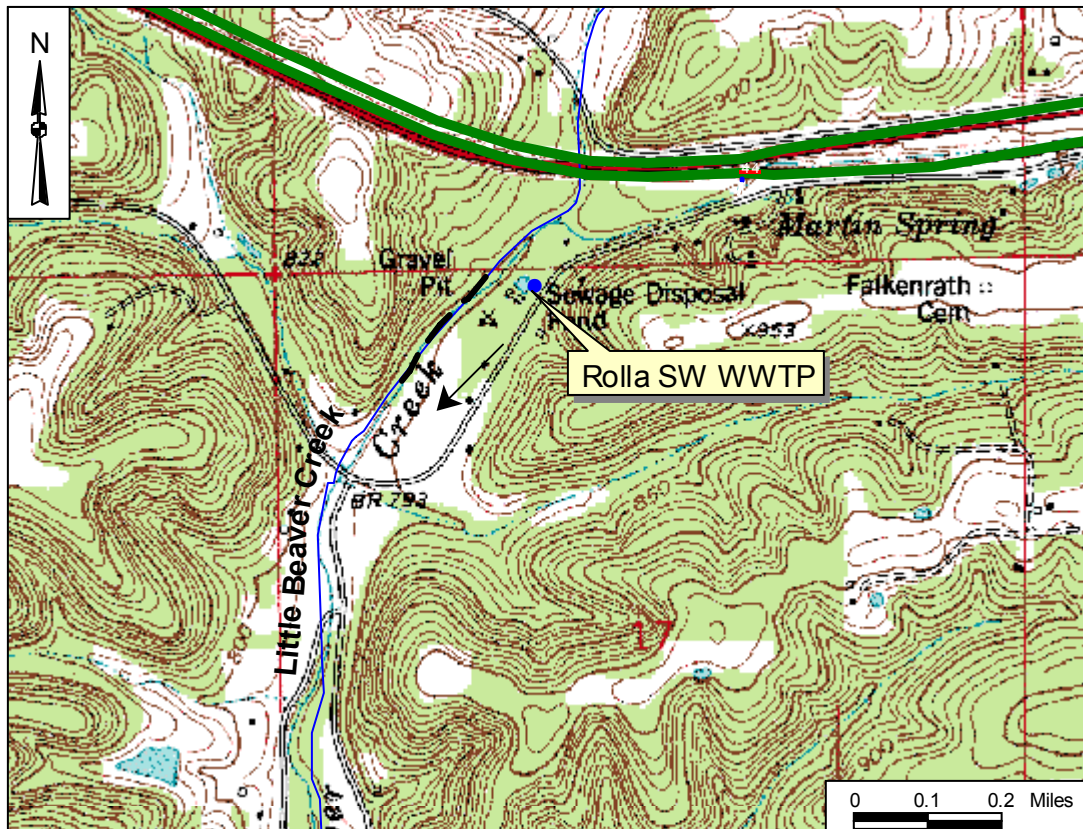
Mean Water Quality Data for Little Beaver Creek, 2003					
Site	AM. Diss. Oxygen (mg/L)	Ammonia (mg/L)	Total Susp. Solids (mg/L)	Volatile Susp. Solids (mg/L)	Percent Fines (Sand/Silt) in Stream Bottom Material
L. Beaver Cr. 0.1 Mi. Upstrm of Rolla WWTP	5.4	<0.03	<5	<5	10.7
L. Beaver Cr. 0.4 Mi. Downstrm of Rolla WWTP	2.6	0.10	6.5	<5	4.8
L. Beaver Cr. 0.6 Mi. Downstrm of Rolla WWTP	1.6	<0.03	<5	<5	2.7
L. Beaver Cr. 1.7 Mi. Downstrm of Rolla WWTP	2.4	<0.03	<5	<5	17.1

Bold numbers indicate exceedence of state water quality standards (5 mg/L for DO).

Like all wastewater discharges in Missouri, the Rolla SW WWTP has to meet the requirements of a discharge permit issued by Missouri Department of Natural Resources. The department reissued the permit for this facility on May 5, 2006, with more stringent limits for BOD and suspended solids. Meeting the new permit requirements will result in improved water quality in Little Beaver Creek. On May 16, 2006, the department submitted the permit in lieu of a TMDL to the U.S. Environmental Protection Agency. EPA accepted the permit in lieu of a TMDL on August 9, 2006.

Map of site shown below.

Rolla SW WWTP on Little Beaver Creek in Phelps County, Missouri



--- Impaired segment

← Direction of flow

For more information call or write:

Missouri Department of Natural Resources

Water Protection Program

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